Accuracy of intraoperative neurophysiologic monitoring during spine surgery
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Introduction
Spine surgery involves correction of spine and decompression of spinal cord in adherence of complex vasculatures which pose high risk to patients. Stagnara wake-up test (SWT) became a gold standard in scoliosis operation. However, it required co-operation of patient. Intraoperative neurophysiologic monitoring (IONM) enhances patient safety regardless of demerit of SWT. Evidence-based guideline in 2012 stated IONM is effective to predict an increased risk of adverse outcomes of paraparesis, paralegia and quadriplegia in spinal surgery. IONM has been routinely implemented in spine service of orthopedic and traumatology department to enhance patient’s safety for a year in our institution.

Objectives

Methodology
IONM was performed from induction of anesthesia to patient emerged from anesthesia by recording both upper (UE) and lower extremities (LE) somatosensory evoked potentials (SSEP) and transcranial electric motor evoked potentials (TceMEP). SSEP was defined as significant change (SC) which amplitude reduced over 50% of baseline or latency increased over 10% of baseline, persisted at least 5 minutes. Decrement of TceMEP amplitude over 80% of baseline was considered as SC. When
SC of EP was recorded, surgeons were informed and remedial measure was implemented. All cases were classified as one of the following conditions. True positive (TP): SC and presence of new postoperative neurologic deficit (POND). True negative (TN): Normal neurophysiologic signals (NS) and absence of new POND. False positive (FP): SC and absence of new POND. False negative (FN): Normal NS and presence of new POND. Demographics of patients were evaluated.

**Result**
During 9-month of time, IONM delivered to 29 patients. Twenty-two males and 7 females, mean age 59.2 (range 27 -80) were included. Mean chronicity was 18.5+-18.9-month. Two classified as emergency and 27 as elective. Mean operation duration was 4.9 +/-2.2-hour. Postoperative orthotic intervention facilitated early rehabilitation. Accuracy of IONM was evaluated in terms of sensitivity and specificity. Both sensitivities of SSEP and TceMEP were 100%. However, specificities of SSEP and TceMEP were 96% and 100% respectively. Incidence of new POND was 3.4%. Enhancement of spine patient's safety was achieved by assessing sensory and motor pathways during surgery. Low incidence of FP (n=1) and FN (n=0) reported in our institution. Only 1 patient reported to have TP. Remedial measure immediately responses to evolving spinal cord injury and adverse neurological consequences and reduce further harm to patients. IONM was effective to predict postoperative neurological deficit with high sensitivity and specificity.